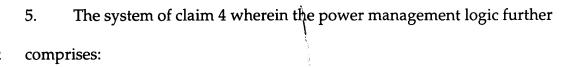
## **CLAIMS**

## What is claimed is:

- 1. A system comprising a central processing unit (CPU), wherein the CPU
- includes power management logic that that enables the CPU to operate in a first
- 3 execution mode whenever the temperature of the CPU exceeds the
- 4 predetermined threshold and operates in a second execution mode whenever the
- 5 temperature of the CPU is below the predetermined threshold.
- 1 2. The system of claim 1 wherein the power management logic comprises:
- 2 a thermal sensor;
- a digital filter coupled to the thermal sensor; and
- an interrupt generating hardware coupled to the digital filter, wherein the
- 5 interrupt generating hardware generates a first interrupt whenever the
- 6 temperature of the CPU exceeds the predetermined threshold and generates a
- 7 second interrupt whenever the temperature of the CPU is below the
- 8 predetermined threshold.
- 1 3. The system of claim 2 wherein the power management logic further
- 2 comprises an analog to digital converter coupled between the thermal sensor and
- 3 the digital filter.
- 1 4. The system of claim 2 further comprising programmable array logic
- 2 (PAL), wherein the PAL includes an interrupt handler for receiving the first and
- 3 second interrupts.



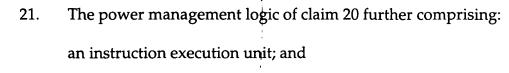
- an instruction execution unit coupled to the interrupt handler; and
  an artificial activity generator coupled to the interrupt handler.
- 1 6. The system of claim 5 wherein the instruction execution unit causes the
- 2 CPU to operate in a full dispersal mode whenever the die temperature is below
- 3 the predetermined threshold temperature and to operate in a single dispersal
- 4 mode whenever the die temperature is above the predetermined threshold
- 5 temperature.
- 1 7. The system of claim 5 wherein the artificial activity generator causes the
- 2 CPU artificial activity generator to suspend artificial activity within the CPU
- 3 whenever the die temperature is above the predetermined threshold
- 4 temperature.
- 1 8. A method comprising:
- determining whether the temperature of a central processing unit (CPU)
- 3 exceeds a predetermined threshold;
- 4 generating a first interrupt if the temperature of the CPU exceeds the
- 5 predetermined threshold; and
- transitioning from a first execution mode to a second execution mode.

- 9. The method of claim 8 wherein the process of transitioning from the first execution mode to the second execution mode comprises:
- 3 interrupting an artificial activity mode; and
- 4 transitioning from a full instruction execution mode to a single instruction
- 5 execution mode.
- 1 10. The method of claim 9 further comprising:
- 2 suspending the execution of code at the CPU after generating the first
- 3 interrupt; and
- 4 resuming the execution of code at the CPU after transitioning to the single
- 5 instruction execution mode.
- 1 11. The method of claim 10 further comprising:
- 2 determining whether the temperature of the CPU exceeds the
- 3 predetermined threshold after transitioning to the single instruction execution
- 4 mode; and
- terminating the operation of the CPU if the temperature of the CPU
- 6 exceeds the predetermined threshold after transitioning to the single instruction
- 7 execution mode.
- 1 12. The method of claim 10 further comprising:
- 2 determining whether the temperature of the CPU exceeds the
- 3 predetermined threshold after transitioning to the single instruction execution
- 4 mode; and

generating a second interrupt if the CPU does not exceed the predetermined threshold after transitioning to the single instruction execution mode.

- 1 13. The method of claim 12 further comprising transitioning from the second
- 2 execution mode to the first execution mode.
- 1 14. The method of claim 13 wherein the process of transitioning from the
- 2 second execution mode to the first execution mode comprises:
- 3 resuming the artificial activity mode; and
- 4 transitioning from the single instruction execution mode to the full
- 5 instruction execution mode.
- 1 15. The method of claim 12 wherein the first interrupt is a high temperature
- 2 interrupt and the second interrupt is a normal temperature interrupt.
- 1 16. A central processing unit (CPU) comprising:
- 2 a thermal sensor;
- an analog to digital converter coupled to the thermal sensor
- a digital filter coupled to the analog to digital converter; and
- 5 an interrupt generating hardware coupled to the digital filter, wherein the
- 6 interrupt generating hardware generates a first interrupt whenever the
- 7 temperature of the CPU exceeds the predetermined threshold and generates a
- 8 second interrupt whenever the temperature of the CPU is below the
- 9 predetermined threshold.

- 17. The CPU of claim 16 further comprising:
- an instruction execution unit; and
- 3 an artificial activity generator.
- 1 18. The CPU of claim 17 wherein the instruction execution unit causes the
- 2 CPU to operate in a full dispersal mode whenever the die temperature is below
- 3 the predetermined threshold temperature and to operate in a single dispersal
- 4 mode whenever the die temperature is above the predetermined threshold
- 5 temperature.
- 1 19. The CPU of claim 16 wherein the artificial activity generator causes the
- 2 artificial activity generator to suspend artificial activity within the CPU
- 3 whenever the die temperature is above the predetermined threshold
- 4 temperature.
- 1 20. Power management logic comprising:
- 2 a thermal sensor;
- an analog to digital converter coupled to the thermal sensor
- a digital filter coupled to the analog to digital converter; and
- 5 an interrupt generating hardware coupled to the digital filter, wherein the
- 6 interrupt generating hardware generates a first interrupt whenever the
- 7 temperature a central processing unit (CPU) exceeds the predetermined
- 8 threshold and generates a second interrupt whenever the temperature of the
- 9 CPU is below the predetermined threshold.



- 3 an artificial activity generator.
- 1 22. The power management logic of claim 20 wherein the instruction
- 2 execution unit causes the CPU to operate in a full dispersal mode whenever the
- 3 die temperature is below the predetermined threshold temperature and to
- 4 operate in a single dispersal mode whenever the die temperature is above the
- 5 predetermined threshold temperature.
- 1 23. The power management logic of claim 20 wherein the artificial activity
- 2 generator causes the artificial activity generator to suspend artificial activity
- within the CPU whenever the die temperature is above the predetermined
   threshold temperature.